Plant Science Says

Merry Christmas

December, 1999

Christmas Party and Cookie Exchange
The annual Plant Sciences Christmas Party will be on December 19 at 4:00 p.m. at Country Lanes (5 miles west of Bozeman on Highway 191). Below is the schedule of activities:

Bowling	4-5
Cocktails, bring in food	5-5:30
Dinner	5:30-6:30
Santa & door prizes	6:30-7:30
Clean-up	7:30-8:00

Please come and join us for any or all of it. All levels of bowling ability will be represented. There is a sign up t in the office for the party.

The Cookie Exchange is December 13, Monday, at 10:00 a.m. in 325 LJH. If you have signed up, please bring 23 bags of cookies with 4 cookies in each bag. If you have extras, please bring them to share with the rest of the department (the non-bakers). It would be helpful if you would bring a bag or container for the cookies you will be taking home.

New Horticulture Turfgrass Professor

We are happy to welcome Dr. Steve Keeley to our department starting on December 29, 1999. He will be filling the position vacated by Dr. Rob Golembiewski. Dr. Keeley is coming to us from Kansas State University where he has worked as an extension turfgrass specialist for the last 3 years. He and his wife have 4 children.

Lab of the Month - 130 ABS
Integrated Management of Potato and Sugar Beet Diseases and Biological Control of Weeds
by Dr. Barry J. Jacobsen
Before our move to the ABS Building our group shared lab facilities in 520 LJH with Dave Sands' group. Following our move to ABS we continue to share equipment with the Sands' group in adjoining131 ABS, in fact the two labs function essentially as one working unit. Our research group works on developing integrated disease management strategies for potato and sugar beet diseases affecting Montana growers. Integrated control systems under study in this laboratory and in field research include evaluation and development of both synthetic chemical and biological controls, identification and evaluation of disease resistant germplasm, use of epidemiological models, fungicide resistance management and integration of these components into profitable systems for growers to use. Field research for sugar beets is located at the Southern Agricultural Research Center at Huntley, at the Eastern Agricultural Research Center at Sidney and in grower's fields in the Yellowstone River Valley from Laurel to Fairview. Potato field research is done in both the Gallatin and Flathead Valleys with the majority of work done here at the campus Horticulture Research Farm. We also apply our expertise in the use of microbial-based disease controls to develop and evaluate biologically-based control systems for houndstongue and Russian knapweed. The weed biological control research is primarily directed by Dr. Nina Zidack who is an Assistant Research Professor. Our lab group travels a lot and we have the unique opportunity to see our results help farmers and land managers.

Potato diseases presently being studied include: **Rhizoctonia black scurf, Fusarium dry rot, early blight, scab and silver scurf**. Doctoral candidate, Ivette Acuna, is doing her thesis on selection of scab resistant germplasm based on resistance to the pathotoxin, Thaxtomin. Dr. Gary Strobel is assisting with the direction of the biochemical aspects of this project. **Sugar beet diseases** being studied include: **Damping-off** caused by *Pythium* sp., *Aphanomyces cochliodes*,

Rhizoctonia solani AG 2-2 and AG 4, **Rhizoctonia crown and root rot, Cercospora leaf spot, sugar beet cyst nematode, Bacterial vascular necrosis and Fusarium yellows**. Doug Collins recently defended and passed his Master of Science exam dealing with autecology and formulation improvement of one of our Bacillus sp. proven useful for control of Cercospora leaf spot.

Field proven *Bacillus*- based biological controls of Montana origin, compatible with new and existing chemical controls, have been identified for most diseases listed and disease resistant germplasm has been identified for Fusarium Yellows, bacterial vascular necrosis and potato scab.

In addition to our focus on biological control our lab group evaluates new and existing pesticides for control of sugar beet and potato diseases, examines management of fungicide resistance in *Cercospora beticola*, studies induced systemic resistance in sugar beet and cooperates with Western Sugar, Imperial Holly Sugar, Seedex, Novartis, BetaSeeds and American Crystal Seeds on evaluation of sugar beet germplasm. Dr. Dan Bergey and MS candidate Rebecca Bargabus are working with us on induced systemic resistance in sugar beet. Our lab was the first to report induction of systemic resistance by a phyllosphere biological control agent.

Our lab group consists of myself, Dr. Nina Zidack, John Ansley (research technician), graduate students Ivette Acuna and Doug Collins (received MS 11/19/99), undergraduate research technicians Andy Lord, Alisa Lilly, Sarita Cantu and until recently, Diedra Barkalow (now a biology teacher in MI) and Lauren Kessler (now a microbiologist with Anderson Precast and Supply in Bozeman). In addition, each summer since 1994 we have had 2 high school students from the Montana Apprenticeship Program. This past summer we had an intern from Germany, Eva Grimme. This continues our German connection started with Andrea Braun (doctoral student) and Sebastian Kiewnick (post doc). Both Andrea and Sebastian are employed by industry in Germany. At the present time I am looking for 1 or 2 new graduate students to work on potato, sugar beet or weed pathology.

Funding for our research comes from the Montana Agricultural Experiment Station, National Science Foundation, USDA, Montana Noxious Weed trust Fund, Bureau of Land Management, Western Sugar Joint Grower Research Committee, Holly Sugar Joint Grower Research Committee, and the following companies; Novartis, Zenaca, Gowan, Du Pont, AgraQuest, Rhone-Poulenc, BASF, Cipcam, Gustafson, BetaSeed, Novartis Seeds, American Crystal Seeds, Seedex, and Taensa.

Employee of the Month - Nina Zidack

An intense interest in the plant kingdom has led me in diverse directions, from killing weeds to protecting plants to farming. Since graduate school, my main research focus has been biological control of weeds with plant pathogens. While still in graduate school at Auburn University in Alabama, my husband Walt and I could not resist the urge to stake our claim on the agricultural economy of Montana, and bought a small vegetable farm in Billings. Our plan was for me to finish my coursework, farm during the summer in Montana, then I would return to Alabama in the winter to finish my dissertation. This prompted a meeting with my advisor Paul Backman and the department head, our own Barry Jacobsen . The general concensus was that no one ever finishes their dissertation after leaving and even more importantly, how would I ever find a job in Montana! Being the obstinate person that I am, I did not listen to their advice, but went farming in the spring of 1991. After two winters back in Alabama, I finished my dissertation in 1993. I was able to be a full time farmer for one year, then in 1994, I received a grant from the Montana Noxious Weed Trust Fund to survey for bacterial pathogens of weeds with USDA at MSU. At this point we added a new residence in Bozeman. The USDA left Bozeman in 1996, and I was adopted by Barry and expanded my research into biocontrol of plant pathogens. We still operate our farm in Billings. Walt generally spends a few months full time on the farm while I travel back and forth on weekends during the summer. Our main crops have been sweet corn, melons, cucumbers, peppers, tomatoes, and pumpkins. Our business in now evolving into more of a fall-family-entertainment scheme complete with a corn maze and hayrides. Next year, we will probably just grow pumpkins for the fall enterprise.

Up until now, I have left the two most important factors in my life equation out; my two daughters, Madeline and Julia. Madeline is 5, loves rules, order, and organization.

Julia is 1 and shows signs of being an anarchist. Both girls love the farm and Bozeman, and for now, Walt ner Ag-economist, now a Bozeman contractor) and I have decided to maintain our dual lives as Billings farmers and Bozeman yuppies.

Molecular Evolution Conference
by Adam Richman

The fourth Gordon Conference in Molecular Evolution met at the Sokendai Institute for Graduate Study in Hayama, Japan October 25-29. Hayama is located on the Kamakura Peninsula, an hour south of Tokyo by train. From Hayama, there are spectacular views of Mt. Fuji across the water to the east. There are also significant temples and shrines in nearby Kamakura, including the Daibutsu Buddha shown here. The Sokendai facility is very impressive, and includes a sushi chef on staff, something I intend to bring up as a hiring priority at the next faculty meeting.

I was invited to talk on molecular evolution in plants, and presented my recent work on the use of coalescent theory in detecting the effects of population bottlenecks on genetic variation at the self-incompatibility (S-) locus in the Solanaceae. I showed that recent methods for testing for equilibrium expectation under coalescent theory appear to be very insensitive to bottlenecks, and proposed an alternative method of analysis.

Claude dePamphilis of Pennsylvania State University spoke on the evolution of parasitism in plants, and described a remarkable pattern of horizontal transmission of a bacterial rRNA gene in parasitic plants, which are known to have arisen independently many times. The most provocative explanation for this result is an invasion of the body snatchers' scenario in which the plant genome is co-opted by the genetic program of the bacterial parasite leading to adoption of the parasitic habit as an adaptation for the propagation of the bacterium. More plausibly, the horizontal transfer occurs as the result of convergent adaptation after the adoption of the parasitic habit.

Evolution occurs in other organisms than plants, and one of the more provocative talks included an interesting treatment of recent data showing that Neandertal mitochondrial DNA is descended from a lineage distinct from that found in modern humans, suggesting that Neandertals failed to contribute to our gene pool. Magnus Magnusson (University of Lund) presented a coalescent analysis indicating that it is possible and even likely that the divergent Neandertal mtDNA sequence has not been found in current human populations simply due to stochastic sorting of this maternally inherited sequence in the last 30,000 years.

Evolutionary thinking is speeding progress in many areas of biology. For example, Billie Swalla (Friday Harbor Laboratories, University of Washington) is using an evolutionary approach to study the development of the notochord in Ascidians. Ascidians are very simple chordates which pass through a tadpole larval stage. However, some species have derived a tailless larva. This adaptation has occurred independently multiple times and study of the differences in gene expression among these species have identified genes involved in the development of the notochord.

Beware of Black Henbane, a member of the tomato-potato family (Solanaceae)
by Cathy Seibert, MSU Herbarium

This past October, I received a phone call from Marty Malone, the Park County Extension Agent. He described a plant specimen involved in a poisoning case in Livingston and asked if I could identify an electronic image of it. The image included just a root and leaf (below). Livingston Memorial Hospital called as I was looking at the attached email image. They said an elderly patient had eaten this plant, which was harvested from his garden, and that he was now delirious. I told them it looked like Black Henbane (*Hyoscyamus niger* of the plant family Solanaceae). Hospital staff had been trying for several hours to find someone who could identify this poisonous plant, so they brought the actual root and leaf specimen from Livingston to me, where I confirmed that it was Black Henbane. Finally, the hospital staff was able to call the poison control center with definitive information. Happily, the patient had begun to recover on his own at about this same time.

Black Henbane is a weed occasionally seen around Bozeman and vicinity. It is most commonly a biennial,

which means it exists its first year of life as a rosette of es. This rosette may be confused with some varieties of lettuce or other similar greens grown in the garden. If Black Henbane does make it as a weed into your garden, just remember that its leaves are covered with a soft fine hair, which is not usually the case for lettuce and other cultivated greens. Also, most people can detect a mildly foul pungent odor to the leaves of Black Henbane, especially when they are shredded. Thus, if you are preparing greens that stink and are covered with fine hair, don't eat them!

See the Texas A&M (http://www.csdl.tamu.edu/FLORA/schoepke/hyo_ni_1.jpg) or Missouri Botanical Garden (http://www.mobot.org/MOBOT/research/library/kohler/1763_011.jpg) for additional photos of Black Henbane.

Agronomy, Crop, and Soil Meetings
by Jamie Sherman

The Ninety-first Annual American Society of Agronomy, Crop Science Society of America and Soil Science Society of America meetings were held the first week of November in Salt Lake City, Utah. Attendees from the Department of Plant Sciences included Jamie Baley, Jim Berg, Nancy Blake, Phil Bruckner, Pat Hensleigh, Susan Lanning, Deven See, Gail Sharp, Jamie Sherman and Luther Talbert. Most of these individuals either gave a poster or slide presentation. Everyone enjoyed catching up with old colleagues and making new contacts. Jamie Baley and Deven See took advantage of the Career Development Service. Several interesting symposia were given including such diverse topics as the molecular biology of disease resistence, linking genomics and germplasm, and crop modeling in the 21st century. Nancy Blake said "I came away with some ideas on different approaches our lab could take with its current projects. Specifically ways of analyzing our molecular marker data in regards to wheat evolution." Salt Lake City was a wonderful city for a convention with hotels, restaurants and interesting diversions all within walking distance of the convention center. Jim Berg enjoyed eating at the Star of India, but warned against trying green mango pickles. Several people had the opportunity to go to a John Prine concert and said it was a highlight of the trip.

Grants

John Sherwood

Disruption of the sexual cycle of fungal plant pathogens with pheromone analogs, USDA

New Employees
Jane Jessell - 316 LJH

After an absence of three years, I'm glad to be back at MSU and especially glad to be once again associated with the Department of Plant Sciences. Originally hired by Jack Riesselman in 1979 (thanks, Jack!), I spent many years in the department, first as a part-time manuscript typist, then as departmental secretary, and finally as program assistant for Dave Sands with his Biocontrol of Weeds project. Currently I am working with Mark Young and Tim McDermott and the Thermal Biology Institute, which will direct studies in thermal biology from the cellular to the ecosystem levels. During my three years away from MSU, I worked as an assistant to a communications lobbyist in Washington, DC, a volunteer at a used bookstore in Pittsburgh, and as a travel agent here in Bozeman. Other travels took me to Costa Rica, England, France, and Hollywood, where I attended the Emmy Awards this year and appeared on *Jeopardy!* in 1998 ("I'll take Famous Mycologists for $200, Alex!) My sons Zachary and Matthew are now 23 and 22, respectively, and are both attending MSU. Aging quickly yet gracefully, I look forward to the new millennium, my new job, and turning 50 in January. Yikes.

Roy Miner - 419 LJH

Hi, my name is Roy Miner and I am currently working in Luther Talbert's laboratory as a laboratory technician. Presently, I am running Amplified Fragment Length Polymorphisms to examine evolutionary similarities and differences between modern wheat and its ancestors.

I graduated in May of 1997 with a degree in Applied Chemistry from David Lipscomb University, but I am from Danville, Virginia originally. After graduation, I married Laura, my "Big Sky' sweetheart who happens to be a Bozeman native. After graduation, I worked in

pediatric research at Vanderbilt University in Nashville ›loping vaccines for children. We have moved here, so my wife can finish school at Montana State University while her mother takes care of our 16-month-old daughter Cherie.

I am actually applying to medical school and will possibly be matriculating next year. When I am not working, I enjoy playing with my daughter, reading, drawing, watching college football, fishing, and participating in outdoor activities with my wife.

December Birthdays

Theodore Clack	3
William Grey	4
Nancy Blake	6
Martha Mikkelson	6
Carol Asleson	13
Susan Lanning	15
Cathy Seibert	21
John Ansley	23
Sue Brumfield	26
Dick Pohl	29
Lucy Cooke	30

Happy Birthday!

Recipe of the Month
by Jack, the famous gourmet cook, Riesselman

Oyster Soup - great for Christmas Eve

4 cups of milk
1 jar oysters cup up
1 stick of butter, melted
2 Tbsp of chopped onion

Saute onions and oysters in the butter. Add milk. Heat through but do not boil. Serve with a sprig of parsley.

Poached Eggs with Hollandaise Sauce
Poach eggs
Sliced (thin) smoked salmon
Hollandaise Sauce:
- 1 stick butter
- Yolk of 2 eggs
- 2-3 tsp fresh lemon juice
- Slowly melt and whisk together-do not overcook

On open English muffins layer the egg, salmon and then sauce. Can also use Canadian Bacon in place of the ›on.

And a Happy New Year!